

**EXHIBIT "A"**

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## STABILEZE® 06 & QM

*thickeners and stabilizers*

**DESCRIPTION**

Methyl vinyl ether/maleic anhydride copolymer crosslinked with 1,9-decadiene.

Supplied as a white powder (100%).

**PROPERTIES**

Supplied as a white powder which disperses easily in water. Clear gels are developed by first hydrolyzing anhydride groups to diacid form by heating and then adjusting pH with organic or inorganic bases to obtain desired viscosity. Alternatively, hydrolysis and neutralization can be accomplished in one step by heating with an inorganic base. Clear, aqueous gels formed at low use levels (0.25 - 0.50%). Effective over wide pH range (3-11). Shear-thinning allows strong gels with quick break for processing, spreading and dispensing. Gels have excellent stability to shear, temperature and UVA radiation. Not tacky. Leaves smooth, soft feel on skin and hair. Enhances hold property of hair styling products. Widely compatible with personal care ingredients.

**INCI Name**

PVM/MA Decadiene Crosspolymer

**APPLICATIONS**

Thickening of all types of aqueous gels and nonionic creams and lotions for personal care. Can also be used in hydroalcoholic systems, and to thicken other liquids such as glycerine and acetone (nail varnish remover).

## STABILEZE® 06 & STABILEZE® QM

### USER NEEDS

Thickeners/Stabilizers which enable thick, luxurious products to be manufactured with ease and at low cost. Products such as skin creams and lotions; sunscreens; moisturizers; barrier creams; hair styling gels; shampoos; nail varnish removers.

### INNOVATION PROVIDED

Stabileze 06 and QM are non-acrylic thickeners/stabilizers based on ISP's well-established methyl vinyl ether/maleic anhydride (PVM/MA) chemistry. They have been developed specifically for skincare, haircare and pigmented cosmetics where they provide advantages over other commonly used thickeners. They are easier to disperse, effective at lower use levels and offer better shear and temperature stability compared to other thickeners, including acrylates. The two polymers are alike in every important respect, except that Stabileze QM has a smaller particle size and therefore, disperses faster than Stabileze 06, and is converted more rapidly to a gel. This difference is

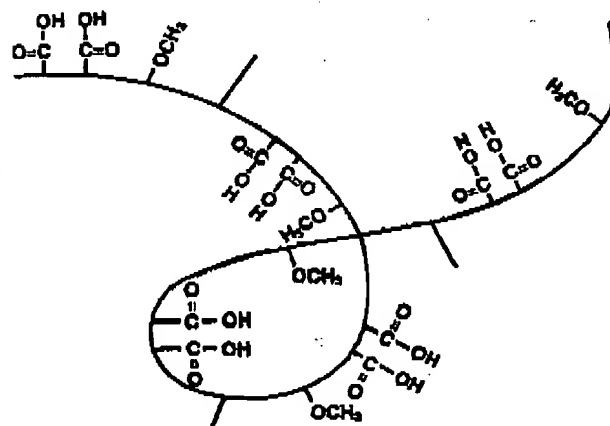
especially beneficial in cold mix systems. They are broadly compatible with cosmetic ingredients and can be used to thicken aqueous and non-aqueous systems, in which they impart a richer, smoother feel to the skin and hair.

### PRODUCT PROFILE

#### Chemistry

Stabileze 06 and Stabileze QM are benzene-free copolymers of methyl vinyl ether/maleic anhydride, crosslinked with 1,9-decadiene, INCI adopted name PVM/MA Decadiene Crosspolymer (see Figure 1). When the polymer is dispersed in water the maleic anhydride rings are hydrolyzed to give free diacid groups. Hydrolysis is accelerated by heating. Maximum viscosity is obtained by then neutralizing the diacid with either an organic or inorganic base.

Figure 1:  
Schematic representation of the structure of Stabileze in its hydrolyzed form.



## TYPICAL PROPERTIES

Properties	Stabileze 06	Stabileze QM
Physical form:	white powder	white powder
Moisture content (%)	<10%	<10%
Viscosity at 25°C (0.5% aq at pH7: Brookfield RVT, spindle A7 20rpm):	45,000 - 70,000 cps	45,000 - 70,000 cps
Particle size:	<850µ	<75µ

## PERFORMANCE DATA

### Ease of handling

Stabileze polymer powders wet out rapidly, normally within 180 seconds. Unlike many hydrophilic thickeners they disperse easily in water without lumping. This saves time and processing costs.

When first added to water, the dispersion will be milky but with hydrolysis to the diacid, the solution will become translucent. Heat accelerates this process, and Stabileze QM will hydrolyze faster than Stabileze 06.

Figure 2:

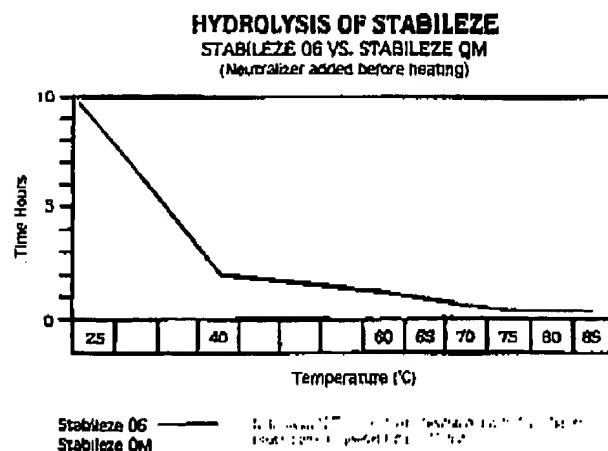
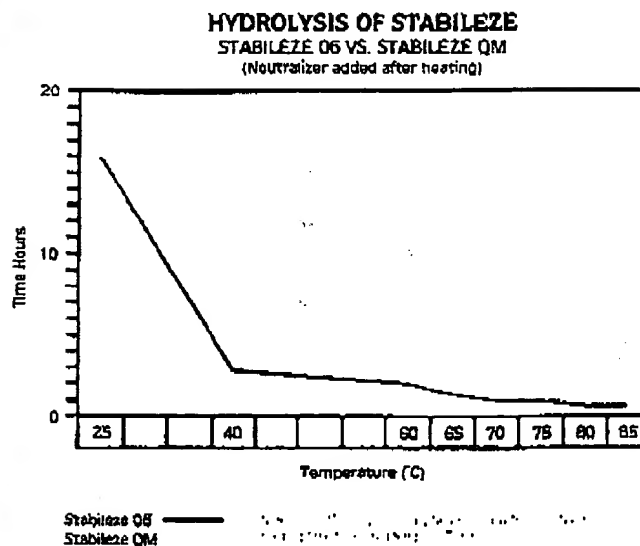


Figure 2a:



Some thickening occurs at this stage, but the final gelation and clarity is obtained when the solution is neutralized with one of a wide choice of bases. For all bases, using the amount needed to achieve a pH of 7 will give the fastest hydration and clearing. Once the gel is formed, the pH can be adjusted to suit the desired formulation. Unlike acrylic acid thickeners, Stabileze polymers thicken by first undergoing a chemical reaction (hydrolysis, or opening of an anhydride ring) followed by neutralization, so pH can be adjusted after the gels are formed.

Figure 3:

**Stoichiometric Equivalents of Bases for pH 7.0**  
(Stabileze Polymer : Base)

Base	Wt. Ratio	Resulting viscosity with 0.5% Stabileze (CPS)
10% NaOH	1:2.7	99.8K
10% KOH	1:4.0	108.0K
30% NH4OH	1:0.6	107.0K
Monoethanolamine	1:0.4	99.0K
Diethanolamine	1:0.7	103.0K
Triethanolamine	1:1.0	98.5K
Aminomethylpropanol	1:0.6	86.3K
Aminomethylpropanediol	1:0.7	99.0K
Tromethamine	1:0.8	100.0K
Sodium Hydroxymethyl Glycinate	1:1.7	103.0K
Tetrahydroxypropylethylenediamine	1:1.8	111.0K

\*TS 6 spindle, 10 rpm